

Applicant's Docket No. RD-25712  
Appl. No. 09/319,906  
Amdt. dated Aug. 2003  
Reply to Office communication of May 6, 2003

**Amendment to the Claims:**

This listing of claims will replace all prior versions, and listings, of claim in the application.

**Listing of Claims:**

1 to 8 (canceled).

9 (previously presented): A method of making a metal casting comprising the steps of:

- a. placing a mold in a mold furnace having a heater;
- b. heating the mold to a temperature of about 100 to 150 °C above a liquidus temperature of a casting alloy;
- c. pouring a molten casing alloy into the heated mold;
- d. lowering the mold with the molten alloy into a cooling zone comprising a tank having an open upper portion and a closed bottom portion with water-cooled walls extending therebetween, the open upper portion being immediately adjacent to the heating zone; and
- e. solidifying the molten alloy by radiation cooling onto the water-cooled wall of the tank to form the metal casting.

10 (original): The method of claim 9 where the mold passes through a baffle located between the heating zone and the cooling zone.

11 to 14 (canceled).

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15 (previously presented): The method of claim 9 wherein the tank has a truncated cross-sectional with the bottom portion having a smaller base than the upper portion.

16 (previously presented): The method of claim 9 wherein the mold has a starter cavity for a crystal having a defined crystal orientation.

17 (previously presented): The method of claim 9 wherein the tank has a double layer wall.

18 (previously presented): The method of claim 9 wherein the tank is made of stainless steel.

19 (previously presented): The method of claim 9 wherein the mold is made of a ceramic.

20 (previously presented): The method of claim 9 wherein the mold and the furnace are disposed in a vacuum chamber.

21 (previously presented): The method of claim 9 wherein the furnace comprises a preheating furnace and an induction furnace.

22 (previously presented): A method of making a metal casting comprising the steps of:

- a. placing a casting alloy into a furnace having a preheater in a vacuum chamber;
- b. lowering the alloy into the preheating furnace;
- c. evacuating the vacuum chamber;

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- d. heating the alloy to a temperature of about 100 to 150 °C above a liquidus temperature of the alloy to provide a molten alloy;
- e. providing a heating furnace to heat the mold; the heating furnace having a heating zone;
- f. pouring molten alloy into the heated mold;
- g. disposing a baffle under the heating zone;
- h. lowering the mold with the molten alloy into a cooling zone comprising a tank having an open upper portion and a closed bottom portion with water-cooled walls extending therebetween, the open upper portion being immediately adjacent to the heating zone;
- i. turning off the preheater and the furnace heater;
- j. solidifying the molten alloy by radiation cooling onto the water-cooled wall of the tank until the temperature is decreased to 300-400° C;
- k. decompressing the vacuum chamber, and
- l. extracting the solidified metal casting

23 (previously presented): The method of claim 22 wherein the mold has a starter cavity for a crystal having a defined crystal orientation.

24 (previously presented): The method of claim 22 wherein the tank has a truncated cross-sectional with the bottom portion having a smaller base than the upper portion.

25 (currently amended): The method of claim ~~22~~ 24 wherein the mold has a starter cavity for a crystal having a defined crystal orientation

26 (new) The method of claim 9 wherein the cooling zone is instead of a chill plate.

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27 (new): The method of claim 22 wherein the cooling zone is instead of a  
chill plate.